

Claims

What is claimed:

1. A pneumatic radial ply tire having a tread, a carcass with two sidewalls, two
5 inextensible annular beads, a radial ply structure, a belt structure located between the tread and the radial ply structure, and an air impermeable innerliner, said tire being characterized by:

a crown stiffening underlay structure disposed radially inward of and adjacent the belt structure and radially outward of and adjacent the radial ply structure, the underlay structure
10 being comprised of a single flat strip of material disposed in a plurality of spaced apart circumferential windings about the tire carcass, the flat strip being comprised of:

a plurality of high modulus essentially inextensible cords embedded more or less parallel to one another within an elastomeric matrix.

2. The tire of Claim 1 in which the high modulus essentially inextensible cords are
15 made of a material selected from a group of materials exemplified by nylon, rayon, polyester, aramid, metal and glass.

3. The tire of Claim 1 in which the overall lateral width of the underlay structure is less than the lateral width of the breaker structure.

4. The tire of Claim 1 in which the plurality of essentially inextensible cords
20 embedded within the elastomeric matrix of the underlay structure are cut at regular intervals of between about 10 cm and 20 cm, most preferably at about 15 cm intervals to enable the underlay strip to increase in length to accommodate the increase in circumference as the green tire carcass is blown up into a toroidal carcass shape.

5. A pneumatic radial ply tire having a tread, a carcass with two sidewalls, two
25 inextensible annular beads, a radial ply structure, a belt structure located between the tread and the radial ply structure, and an air impermeable innerliner, said tire characterized by:

a crown stiffening underlay structure disposed radially inward of and adjacent the belt structure and radially outward of and adjacent the radial ply structure, the underlay structure being comprised of a single flat strip of material disposed in a plurality of spaced apart
30 circumferential windings about the tire carcass, the flat strip being comprised of:

a plurality of high modulus essentially inextensible cords embedded more or less parallel to one another within an elastomeric matrix; and

a beam made of elastomeric material that is contiguous with the elastomeric

matrix in which the high modulus essentially inextensible cords are embedded.

6. The tire of Claim 5 in which the high modulus essentially inextensible cords are made of a material selected from a group of materials exemplified by nylon, rayon, polyester, aramid, glass and metal.

5 7. The tire of Claim 5 in which the overall lateral width of the underlay structure is less than the lateral width of the breaker structure.

8. The tire of Claim 5 in which the plurality of essentially inextensible cords embedded within the elastomeric material of the underlay structure are cut at regular intervals of between about 10 cm and 20 cm, most preferably at about 15 cm intervals in order to
10 enable the underlay strip to accommodate the blown up of the green tire carcass into the toroidal carcass shape.

9. The tire of Claim 5 in which the beam is made of elastomeric material having a modulus of elasticity that is equal to or greater than the modulus of elasticity of the elastomeric material within which the essentially inextensible cords are embedded.

15 10. The tire of Claim 5 in which the beam has a thickness of between about 1 mm and 10 mm and most preferably a thickness of between about 3 mm and 7 mm.

11. The tire of Claim 5 in which the beam portion of the underlay structure is positioned radially inward of the main body of the underlay structure.

12. The tire of Claim 5 in which the beam portion of the underlay structure is
20 positioned radially outward of the main body of the underlay structure.

13. A pneumatic radial ply tire having a tread, a carcass with two sidewalls, two inextensible annular beads, a radial ply structure, a belt structure located between the tread and the radial ply structure, and an air impermeable innerliner, said tire characterized by:

a crown stiffening underlay structure disposed radially inward of and adjacent the
25 radial ply structure and radially outward of and adjacent the innerliner, the underlay structure being comprised of a single flat strip of material disposed in a plurality of spaced apart circumferential windings about the tire carcass, the flat strip being comprised of:

a plurality of high modulus essentially inextensible cords embedded more or less parallel to one another within an elastomeric matrix.

30 14. The tire of Claim 13 in which the high modulus essentially inextensible cords are made of a material selected from a group of materials exemplified by nylon, rayon, polyester, aramid, glass and metal.

15. The tire of Claim 13 in which the overall lateral width of the underlay structure is

less than the lateral width of the breaker structure.

16. The tire of Claim 13 in which the plurality of essentially inextensible cords embedded within the elastomeric material of the underlay structure are cut at regular intervals of between about 10 cm and 20 cm, most preferably at about 15 cm intervals in order to
5 enable the underlay strip to accommodate the blown up of the green tire carcass into the toroidal carcass shape.

17. A pneumatic radial ply tire having a tread, a carcass with two sidewalls, two inextensible annular beads, a radial ply structure, a belt structure located between the tread and the radial ply structure, and an air impermeable innerliner, said tire characterized by:

10 a crown stiffening underlay structure disposed radially inward of and adjacent the radial ply structure and radially outward of and adjacent the innerliner, the underlay structure being comprised of a single flat strip of material disposed in a plurality of spaced apart circumferential windings about the tire carcass, the flat strip being comprised of:

a plurality of high modulus essentially inextensible cords embedded more or less
15 parallel to one another within an elastomeric matrix; and

a beam made of elastomeric material that is contiguous with the elastomeric matrix in which the high modulus essentially inextensible cords are embedded.

18. The tire of Claim 17 in which the high modulus essentially inextensible cords are made of a material selected from a group of materials exemplified by nylon, rayon, polyester,
20 aramid, glass and metal.

19. The tire of Claim 17 in which the overall lateral width of the underlay structure is less than the lateral width of the breaker structure.

20. The tire of Claim 17 in which the plurality of essentially inextensible cords embedded within the elastomeric material of the underlay structure are cut at regular intervals
25 of between about 10 cm and 20 cm, most preferably at about 15 cm intervals in order to enable the underlay strip to accommodate the blown up of the green tire carcass into the toroidal carcass shape.